

**Economic Assessment
of EPA Proposed Rodenticide
Risk Mitigation Decision**

by

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Background

On January 17, 2007, the U.S. Environmental Protection Agency (EPA) issued its proposed risk mitigation decision for nine rodenticides (docketed at EPA-HQ-OPP-2006-0955). The nine rodenticides covered by this risk mitigation decision are brodifacoum, bromadiolone, difethialone, chlorophacinone, diphacinone, warfarin, zinc phosphide, bromethalin, and cholecalciferol. As part of the proposed risk mitigation decision, EPA anticipates re-classifying all products containing the active ingredients brodifacoum, bromadiolone, and difethialone (the so-called "second generation" anticoagulants) as restricted use products, which would make them unavailable for distribution to and use by consumers. EPA also anticipates requiring that all remaining rodenticide products would be available to consumers only in the form of bait blocks sold exclusively with refillable tamper-resistant bait stations.

The Agency's proposed decision was accompanied by a memorandum, "Impact Assessment for Proposed Rodenticide Mitigation" (hereafter, "Impact Assessment"), dated September, 20, 2006 -- four months before the EPA proposal was issued. This memorandum presents EPA's estimates and assumptions concerning various elements of the Agency's interpretation of the benefits and costs associated with the proposed new restrictions on the use of rodenticides. However, the Biological and Economic Analysis Division (BEAD) memorandum did not provide quantitative estimates of the aggregate size and monetary values of these benefits and costs, although it acknowledges that "households will need to increase their expenses [sic] on rodent control by 195% to 976%". EPA's failure to calculate the aggregate costs and to attempt to quantify the benefits makes it difficult to determine how EPA estimated the aggregate impact of its proposed decision and, indeed, whether the EPA even considered this impact in developing its proposed decision. One particular point of concern is whether the aggregate costs associated with the proposal would be in excess of \$100 million annually, the threshold that commonly is recognized as constituting a substantial impact that warrants a full-scale regulatory analysis as part of the regulatory development and implementation process. This analysis concludes that the Agency's proposal will have an economic impact which will greatly exceed \$100 million -- taking into account only the potential impact upon household users of currently available rodenticides.¹

The BEAD impact assessment similarly omits any calculations of the aggregate impact on low-income households, and, in fact, attempts to minimize this impact by suggesting that the efforts of property managers and public health department control programs obviate the need for low-income apartment dwellers to take any household rodent control measures at all. In failing

¹ Only the economic impact on consumers is evaluated in this assessment. Clearly, there also will be substantial economic impacts borne by state and local governments, various housing authorities, and small and large businesses—particularly those within the agricultural and food storage, preparation, distribution and service sectors. The Agency will also incur additional costs to review tamper-resistant bait stations and bait blocks to determine whether they conform to all of the applicable regulatory standards. Costs imposed on these other sectors are not estimated here.

to take into account the impact on this disproportionately affected population, the Agency ignores the fact that a considerable number of urban households must, and do, take measures to control rats and other rodents currently, and reasonably should be expected to need to do so indefinitely. To their credit, the preparers of the document do eventually admit that the BEAD impact assessment is based on assumptions about household behavior that the Agency acknowledges “may not represent the household’s actual responses to the proposed mitigation actions”. In spite of this, EPA relies heavily on the BEAD assessment in its presentation and defense of the proposed risk mitigation decision.

The impact assessment further concedes that “BEAD cannot accurately predict the market situation for rodenticide products after the new regulation goes into effect.” Among the other uncertainties that the BEAD document does not address are the extent to which rodent resistance to first generation anticoagulants will limit the effectiveness of the alternative rodent control measures it is proposing that consumers utilize. The assessment also does not adequately consider how the loss of the more-effective second generation products will contribute to or exacerbate difficulties in the control of rodent infestations that already are present and are likely to continue in residential dwellings (both in urban and non-urban areas). Finally, the BEAD assessment makes no effort to quantify, or even acknowledge, the societal costs accruing in the form of adverse health effects from increased rodent populations or the use of alternative rodent control measures, particularly non-anticoagulants for which no antidote is currently available.

In summary, the BEAD assessment, in the absence of additional data and more robust analyses, must be determined to be deficient and to fall far short of the statutory requirements of FIFRA and the standards employed by most government agencies for assessing regulatory impacts of their proposed actions.

Scope of This Assessment

As part of this assignment, Heiden Associates² developed an economic impact assessment of the EPA’s proposed rodenticides risk mitigation decision using data on actual household behavior and likely responses to changes in the availability of rodenticides for consumer use derived from the results of a very recent market research study.³ One important objective of this study was to determine whether implementation of the EPA’s proposal would impose aggregate

² Heiden Associates has extensive capabilities and experience in evaluating impact analyses and preparing economic impact assessments for submission in regulatory proceedings, including numerous EPA, Occupational Safety and Health Administration (OSHA), Consumer Product Safety Commission (CPSC), and California Air Resources Board (ARB) rule-makings. A listing of the reports filed in regulatory proceedings is available at www.heideninc.com.

³ The January 2007 TNS Consumer Insights Attitudes & Usage (A&U) report provides valuable data on the demographics, control measure preferences, and attitudes of those who experienced a rodent problem within the previous year.

costs to consumers in excess of \$100 million annually, a threshold that is recognized as constituting a substantial impact and that warrants a full-scale regulatory analysis as part of the regulatory development and implementation process. This assessment also provides analysis and, to the extent possible, quantitative estimates of the following issues relating to the Agency's proposed decision:

1. The size and demographics of households that currently face rodent exposures and the control measures employed in response to these exposures;
2. The costs associated with the need to reformulate or modify existing products and production facilities, and the implications of these costs for the likely retail prices for tamper-resistant bait stations;
3. Household responses to the proposed restrictions on consumer use of rodenticides, and the aggregate costs associated with these responses; and
4. A more complete (and more realistic) assessment of the benefits of the proposal in terms of reduced adverse human exposures to rodenticides, as well as the potentially substantial costs (which EPA failed to assess) associated with human exposures to both increased rodent populations and increased use of non-anticoagulant rodenticides that do not have antidotes.

Summary of Findings

It is clear that the Agency's proposed risk mitigation decision will have a substantial adverse economic impact on consumers generally, and particularly on those in lower-income households who must take measures to control rats. Under a reasonable assessment of consumer responses to the restricted availability of the nine listed rodenticides, the EPA's proposed decision will entail an aggregate economic cost to consumers in excess of \$240 million annually, a level that far exceeds the value of the benefits that could reasonably be attributed to the proposed risk mitigation decision. The following results from our analysis support this conclusion:

1. The BEAD assessment seriously underestimates the extent of rodent problems faced by consumers. There are approximately 20 million households, representing about 17 percent of the all U.S. households, that experience problems with rats, mice, or both types of rodents one or more times annually.⁴ This represents an affected population nearly 2 1/2 times greater than has been estimated by EPA.

⁴ This estimate is very consistent with the 21 million households that the National Pest Management Association (NPMA) estimates have rodent infestations annually, according to recent press releases (see, for example, <http://www.pestworld.org/about/PressRelease.asp?ReleaseID=67>).

2. While households across the entire socio-economic spectrum experience rodent infestations, rodenticide users are more likely to have below-median incomes. The increased costs of rodent control that will result from EPA's proposal will disproportionately affect these households.
 3. EPA has significantly underestimated the incremental costs of bait stations to consumers who ultimately will decide whether to purchase these products to address their rodent problems. Reasonable bait station unit cost estimates based on a more complete assessment of the capital, operating, and distribution costs of tamper-resistant bait stations are nearly three times greater than the estimates that EPA developed.
 4. The BEAD assessment fails to recognize that the majority of current rodenticide bait users eventually will incur costs for control methods other than bait stations to address the rodent problems they face, even if many of them initially purchase the consumer-use rodenticide products that would be available if the proposed decision is implemented:
 - a. Bait stations purchasers will face high control costs, and many will not find the products that will be available to them to be adequate to meet their rodent control needs, both because of potential resistance problems to first-generation anticoagulants and because such products have been demonstrated to be less effective than the second generation technologies.
 - b. Recent market research also shows that a large share of affected households will attempt to control mice and rats by using snap or glue traps, which typically require more placements than using bait packets, and are less likely to control chronic rodent problems effectively when compared to the currently available second generation anticoagulants.
 - c. A small but significant number of consumers will get effective, albeit expensive, control by contracting with pest control operators (PCOs), who would retain access to second-generation anticoagulants under the EPA proposal.
- This analysis demonstrates that it is reasonable to expect that in order for affected households ultimately to achieve effective control of their rodent populations, they will need to do so at a sharply increased cost.
5. While EPA assumes that the number of rodenticide exposures involving children under six would be reduced significantly by the proposed decision, the

Agency has not attempted to quantify the benefits that would accrue if exposures do decrease. Most importantly, the EPA impact assessment fails to take into account that the most recently-generated published assessment of incident data indicates that such exposures do not require medical intervention in the form of medication, office visits or hospitalization. This assessment is corroborated by additional data available from the American Association of Poison Control Centers' (AAPCC) Toxic Exposure Surveillance System (TESS) and the Consumer Product Safety Commission's (CPSC) National Electronic Injury Surveillance System (NEISS). Consequently, the benefits from reduced exposures to second-generation anticoagulants would not be very large, and would be outweighed substantially by the societal costs that will be experienced if consumers no longer have access to the more effective and affordable rodenticides with which they have experience treating infestations.

6. In addition, any benefits that may accrue from reduced exposures are likely to be offset to a significant extent by: a) the direct and immediate adverse health effects that are experienced when users switch to snap and glue traps; b) the potential for unintentional exposures to bait blocks to children in households using bait stations from handling bait stations and/or debris from these units, as well as from access to stored replacement bait blocks; and c) increased numbers of rodent bites in households that use less effective methods of rodent control or simply do nothing if they are not able to purchase currently available consumer-use rodenticides.
7. The BEAD assessment implicitly assumes that rodenticide exposures are in some way unique and of greater concern than unintentional exposures to the wide spectrum of EPA- and CPSC-regulated household chemical products that are not subject to equivalent restrictions on consumer purchase and use. However, it is clear from the TESS reports and NEISS incident records that there are a much larger number of unintentional exposures associated with a wide range of other household chemical products that result in significantly more consequential acute health effects.

The research and analysis that supports each of these findings is set forth below.

Household Rodent Problems and Control Measures Currently Taken

The EPA assessment seriously understates the number of U.S. households that experience rodent control problems annually. The BEAD memorandum estimates that approximately 7% of U.S. households experience rodent problems that would potentially be affected by the proposed decision, based on data from the 2003 American Housing Survey (AHS) upon which EPA relies. However, the AHS asks participants to report signs of rodent activity in the past three months,

rather than in the past year. In addition, the AHS asks only about signs of mice or rats inside the house or building. Consequently, using the AHS estimates does not take into account that some consumers may feel the need to purchase and deploy control products within in their households in response to seeing rodents in nearby structures or elsewhere outside the residence.

A more accurate profile of households experiencing rodent problems is available from recent industry-sponsored market research (the TNS Consumer Insights Attitudes and Usage study, conducted in January 2007).⁵ The TNS study provides valuable data on the demographics, control measure preferences, and attitudes of those who had experienced a rodent problem within the past year. The TNS study indicates that approximately 17% of U.S. households experienced a rodent infestation problem within the past year. Of households with some type of rodent problem, 22% had rats, 90% had mice, and 12% had both types of rodents.⁶

Table 1 summarizes the TNS study results for the responses of households who have experienced one or more rodent infestations during the past year. About three-quarters of households with rodent problems purchased some type of rodent control product (typically traps or baits), while most of the remaining quarter of the rodent-affected households relied on cats, used professional exterminators, or used other methods. Only 4% of the participating households with a rodent problem reported doing nothing about it.

⁵ TNS is a leading international market research firm that includes the world's largest custom research group. Through its 2003 merger with NFO Research, TNS has access to statistically representative samples of several hundred thousand U.S. households recruited to participate in mail, phone, and/or internet-based surveys. Approximately 5,000 households were screened for the study used in this analysis.

⁶ While these market research data were not available to the Agency in preparing the Impact Assessment, similar estimates of the numbers of households affected with rats, mice, or both types of rodents can be derived using the overall number of U.S. households experiencing rodent problems (21 million) estimated by the National Pest Management Association (NPMA) and the relative shares of households with rats and with mice reported in the American Housing Survey data.

Table 1
Household (HH) Responses to Rodent Control Problems

Non-users of Control Products	26%	of HH with rodent problem
rely on cat(s)	12%	
professional exterminator	6%	
other response	5%	
do nothing	4%	
Control Product Users	74%	of HH with rodent problem
most often use traps	42%	
most often use baits	30%	
most often other methods	3%	

Source: TNS Consumer Insights Attitudes & Usage (A&U) Study, January 2007.

The TNS Study also provides useful data on the differences in the types of rodent problems experienced by households who most often traps and those who most often use baits. As Table 2 shows, households faced with rat infestations are significantly more likely to choose rodenticide baits as their preferred rodent control measure than are households experiencing problems only with mice.

Table 2
Characteristics of Trap and Baits Users

	All HH	Trap Users	Baits Users
Type of Rodent Problem			
% w/ mice	90%	94%	86%
% w/ rats	22%	17%	29%
% w/ both mice and rats	12%	11%	15%
Frequency of Rodent Problem			
constant/monthly	15%	13%	12%
2-4 times yearly	43%	45%	42%
<1-1 time	44%	42%	46%
mean # of problems/year	3.2	3.0	2.8
Frequency of Product Purchase			
purchase monthly	16%	13%	12%
2-6 months	29%	45%	42%
> 6 mos.	55%	42%	46%
mean # of purchases/year	5.2	3.0	2.8

Source: TNS Consumer Insights Attitudes & Usage (A&U) Study, January 2007.

The Demographics of Households Experiencing Rodent Problems

BEAD acknowledges that rodent problems, and especially rat problems, are more likely to be experienced by poor and minority households, but the Impact Assessment does not provide estimates of the numbers of these households that would be adversely affected by the proposed risk mitigation decision. The most recent American Housing Survey (AHS) survey results show that in 2005, African-American householders were 64% more likely (1.3% vs. 0.8%) to have seen rats within the past three months than average, and 41% more likely (9.5% vs. 6.7%) to have seen any type of rodent in their dwelling units, compared with U.S. households generally (See Table 3). Similarly, households with incomes under \$20,000 (the poverty line for a family of four in 2005) were 67% more likely (1.3% vs. 0.8%) to have seen rats within the past three months than the average U.S. household, and 35% more likely (9.1% vs. 6.7%) to have seen any type of rodent in their dwelling unit. Most strikingly, Hispanic-headed households reported seeing rats in their dwelling units 173% (2.2% vs. 0.8%) more frequently than did U.S. households generally.

Table 3
3-Month Incidence Rates of Rodents in Occupied Units
(1,000s of housing units)

	Total	African-American	Hispanic	< Poverty Line
All Occupied Units	108,871	13,447	11,651	15,124
# of Occupied Units with:				
Rats	880	179	257	204
Mice	6,140	1,034	753	1,089
Not sure which	309	67	70	84
% of Occupied Units with:				
Rats	0.8%	1.3%	2.2%	1.3%
Mice only	5.9%	8.2%	7.1%	7.8%
Rats and/or Mice	6.7%	9.5%	9.3%	9.1%
Ratio of Group to Total ("Index"): *				
Rats		1.647	2.729	1.669
Mice only		1.382	1.192	1.309
Rats and/or Mice		1.414	1.377	1.352

*Index = % of Households in Group with Rodents / % of U.S. Households Overall with Rodents

Source: American Housing Survey, 2005, Table 2-7.

Combining estimates from these two sources makes it possible to develop a more accurate picture than EPA has portrayed of the rodent problem facing U.S. households generally,

and particularly poor and minority households. We provide these calculations below in Tables 4 and 5.

Table 4
Household Rodent Problems by Ethnicity of Household Head

	# of U.S. HH	With Mice and/or Rats		With Rats	
		%	#	%	#
White	82,003,000	15.0%	12,281,589	2.5%	2,011,894
African-American	13,089,000	24.0%	3,146,334	6.2%	806,254
Hispanic	12,519,000	23.4%	2,930,573	10.2%	1,277,747
Other	6,774,000	16.0%	1,086,954	2.7%	182,104
Total	114,385,000	17.0%	19,445,450	3.7%	4,277,999

Sources: Current Population Survey, March 2006; AHS Survey, 2005; TNS Consumer Insights study, January 2007.

Table 5
Household Rodent Problems by Household Income

	# U.S. HH	With Mice and/or Rats		With Rats	
		%	#	%	#
< \$10,000	9,494,000	23.0%	2,182,895	6.2%	592,535
\$10,000-24,999	21,504,000	19.5%	4,196,036	4.8%	1,029,788
\$25,000-49,999	30,083,000	16.0%	4,823,287	3.3%	1,003,718
\$50,000-74,999	21,047,000	16.0%	3,374,045	3.3%	700,570
\$75,000-99,999	12,697,000	16.0%	2,035,456	3.3%	422,632
\$100,000+	19,560,000	16.0%	3,135,664	3.3%	651,074
Total	114,385,000	17.0%	19,445,450	3.7%	4,277,999

Sources: Current Population Survey, March 2006; AHS Survey, 2005; TNS Consumer Insights study, January 2007.

Applying the 17% rodent problem rate reported in the TNS study to the total number of U.S. households (114,384,000) from the March 2006 Current Population Survey, we estimate that there are 19.4 million households with some type of rodent infestation problem annually. About one-quarter (22%, or 4.3 million) of these households had rat problems. The calculations presented in Tables 3, 4 and 5 demonstrate that rat problems are particularly concentrated in minority and low-income households. Table 4 indicates that minority-headed households account for more than one-third of all households experiencing any type of rodent problem and more than half of those experiencing a rat problem in a typical year. More than one-third (37%) of U.S. households with rat problems fall into the lowest two income groups reported in the AHS data, according to the calculations shown in Table 5.

These disparities in rodent exposure rates suggest that EPA must more seriously consider the “environmental justice” aspects of its proposed action more carefully to avoid imposing disproportionately negative impacts on minority and economically disadvantaged households. For obvious public policy and economic efficiency reasons, the Agency should exercise particular care in ensuring that effective and affordable rodent control measures remain readily available to those who are more likely than other U.S. households to have rodent problems and are less able to afford more expensive control options.

Consumer Choices among Current Control Options

The BEAD impact assessment relies on unfounded and un-sourced assertions about consumers’ choices among currently available rodent control options and those that might be marketed if use of second generation anticoagulant rodenticide baits were to become restricted. In contrast, a valid assessment of the economic impact of EPA’s proposal should use actual data and estimates of the numbers of households currently relying on each currently available control option to assess the extent to which households facing loss of their preferred option would switch to each remaining or newly available control option if EPA adopted the proposed decision.

Table 6 reports percentages of households with rodents in the TNS market research study who utilize each of the various control options available (e.g., baits, snap traps) and of those who do nothing at all . Separate percentages are provided for the proportions of households with rodent problems that have ever used a control method; have used it in the past 12 months; use it most often; and used it most recently.

Table 6
Current Control Measures Used by Households Experiencing Rodent Problems

	Baits	Snap Traps	Glue Traps	Other Traps	PCOs	Cat
TNS Study Methods Used						
Ever	49%	53%	34%	11%	14%	27%
Past 12 Months	41%	39%	22%	8%	9%	21%
Most Often	31%	26%	13%	4%	7%	14%
Most Recently	35%	29%	14%	4%	8%	16%
Estimated # of HH						
Ever	9,528,000	10,306,000	6,611,000	2,139,000	2,722,000	5,250,000
Past 12 Months	7,973,000	7,584,000	4,278,000	1,556,000	1,750,000	4,084,000
Most Often	6,028,000	5,056,000	2,528,000	778,000	1,361,000	2,722,000
Most Recently	6,806,000	5,639,000	2,722,000	778,000	1,556,000	3,111,000

Note: Some percentages do not sum to 100 because of use of multiple control measures.

Source: TNS Consumer Insights Attitudes & Usage (A&U) Study, January 2007.

Table 6 shows that rodenticide baits are the most popularly employed control measure, with 31% of rodent-affected households most often using baits to address problems. Snap traps are nearly as popular (26%) as baits; glue traps are about half as popular (13%) as snap traps; and other types of traps (humane/live traps and electric/electronic traps) and use of PCOs were most recently employed by only 4% and 7% respectively, of households to control rodent infestation problems.

These estimates make clear that a very large number of U.S. households with rodent problems will be adversely affected by restrictions on rodenticide bait purchase and use. Applying the 31% estimated share of households most frequently using baits to the estimated number of U.S. households with rodent problems from Table 4 (19.4 million) yields an estimate of 6.03 million households that currently most often use rodenticide baits to control rats and/or mice. These six million households will be forced to find new alternatives under EPA's proposed decision.⁷

Costs and Retail Prices of Tamper-Resistant Bait Stations

EPA has not accurately estimated the costs to these six million current bait-using households if they had to abide by newly mandated control methods (i.e. the use of tamper-resistant bait stations). Specifically, the BEAD assessment seriously underestimates the likely unit costs for both mouse bait stations and the larger stations appropriate for rats (at \$2.47 and \$11.31, respectively). EPA indicates that these per-placement cost estimates are based on current market data, but it has not been demonstrated that the products currently available are able to meet EPA's guidance concerning tamper-resistance. Further, such products typically use second-generation anticoagulant baits which will no longer be available to consumers.

To get more reliable estimates of the likely costs to the consumer of tamper-resistant bait stations that would be compliant with the Agency's proposed decision, we asked industry representatives to estimate the direct materials-and-labor cost of the product and to provide the operating and retailer margins that currently characterize products sold in this market.⁸ These materials-and-labor costs were then adjusted to incorporate costs and other elements that are

⁷ According to the estimate from Table 2, 29% of households that use baits most frequently have rat problems. This means that about 1.75 million of the 6.03 million households who currently most often use baits are attempting to control rats.

⁸ It should be noted, however, that these unit cost estimates may not fully capture the variable costs associated with tamper-resistant stations, in large part because the lack of an established, published EPA protocol for certifying tamper-resistance makes it difficult to assess whether a particular design would meet standards the Agency might articulate after it has adopted its final decision. It is also not clear the extent to which EPA's proposal, if implemented, might have an effect on the costs of the first-generation active ingredients and certain inert ingredients that will become increasingly in demand as registrants are forced to return to older technologies and incorporate them into bait-block configurations.

included in the operating margin associated with sales of the product. It is important to note that most of the operating margin does not represent profit to distributors and retailers, but rather contribution to costs that do not vary directly with the number of units sold. For example, in the context of the proposed decision, these overhead costs will include the added regulatory, research & development, and scientific services costs required to obtain registration of the newly-developed alternatives to existing consumer-use products.⁹ Significant costs also will be incurred by retailers who will need to reconfigure store shelf space to accommodate the larger cartons and cases in which the new products will be sold. There also will be costs associated with marketing and consumer education efforts to publicize the changeover in rodent control methods requiring bait blocks and boxes and to explain the proper placement, use, and maintenance of the tamper-resistant bait stations.

Taking into account both direct costs and these elements of overhead and distributor and retailer margins, industry representatives have estimated that retail pricing of the bait stations and bait blocks that comply with the EPA's proposed decision would be as follows:

- \$33.41 per rat bait station
- \$13.02 per mouse bait station
- \$4.25 per replacement bait block

Current rodent control costs using rodenticide baits are invariably less than \$2 per placement, so these retail price estimates for tamper-resistant bait stations represent 500% (mice) to 1500% (rat) increases in per-placement control costs for households with rodent problems. These estimates demonstrate that the BEAD impact assessment seriously understates the incremental costs that would be incurred by consumers who would switch (at least initially) to bait stations if their currently preferred means of controlling rodents no longer was available. These incremental costs to consumers will be much higher if consumers do not re-use the bait stations for extended periods of time.¹⁰

Likely Consumer Responses to Restricted Rodenticide Access

The BEAD impact assessment anticipates that most consumers who can no longer use second-generation anticoagulants will instead purchase tamper-resistant bait stations that use either first-generation anticoagulant or non-anticoagulant bait blocks. This assertion is offered without support or sourcing, and is questionable on at least two grounds. First, even using the

⁹ Among those costs are the resources that will be required to test new products and formulations for efficacy in support of product registration efforts for EPA authorizations.

¹⁰ The TNS study indicates that the rate of re-use for snap traps is about 63%, and of those who re-use them, half do not clean them before re-use. It would therefore be reasonable to expect that re-use of bait stations will occur, and that re-use in this manner will expose users to many of the same potential adverse health consequences as those who re-use snap traps currently face, although the Agency's benefits assessment does not address this issue.

EPA unit cost estimates, the cost of controlling all but the most intermittent problems is substantially higher using bait stations than the costs incurred by consumers currently using rodenticide bait placements, particularly for households facing rat infestations. The more realistic cost numbers provided in this document reinforce this assessment. Second, use of bait stations requires the consumer to have the same types of interactions with the control mechanism that are required of snap and glue traps - i.e. trap checking and re-baiting, as well as potential contact with a rodent.

In contrast, our economic impact assessment projects household responses to the proposed restrictions on use of rodenticide baits using recent, reliable data on actual consumer behavior. The TNS market research study results strongly suggests that there will be significant resistance to the use of bait blocks and bait stations among current and typical users of rodenticide baits if their preferred control measure no longer remains available. For example, the TNS study establishes that consumers are very cost-sensitive when choosing control measures (66% cited expense as the primary reason why they chose not to use PCOs). The TNS study further indicates that baits are preferred by household users because they do not involve contact with rodents and are not re-used.

One key set of results from the TNS study is a "switching matrix" that reports on the rodent control measures chosen by households that have changed methods since they first began addressing a rat or mouse problem. These results are presented in Table 7.

Table 7
Switching Behavior by Rodent Control Measure Users

Method Switched to:	Method Switched From:					
	Baits	Snap Traps	Glue Traps	Other Traps	PCOs	Nothing
Baits	49%	60%	23%	60%	48%	31%
Snap Traps	26%	12%	36%	21%	31%	35%
Glue Traps	17%	20%	26%	19%	16%	14%
Other Traps	1%	1%	4%	0%	0%	3%
PCOs	6%	7%	11%	0%	0%	10%
Nothing	0%	0%	0%	0%	5%	8%

Source: TNS Consumer Insights Attitudes & Usage (A&U) Study, January 2007.

Among those who used baits previously and switched to another type of rodent control, nearly half (49%) switched to another type or brand of bait, while most of the remainder switched to snap traps (26%), glue traps (17%), or PCOs (6%) as the method of control used most frequently. Very few households (< 2%) discontinued using all forms of rodent control measures if the rodent problem was not resolved.

These “switching” results can be used to estimate the numbers of households that would be likely to switch to each available control option if EPA’s proposed decision is implemented. Numbers of affected households are calculated by multiplying the switching percentages from the TNS study and the current numbers of bait-using households dealing with rats (1.75 million households) and those attempting to control mice only (4.28 million households).

Frequency of Rodent Control Measure Deployment

The BEAD impact assessment also incorrectly assumes that households with rats or mice have a “one-and-done” experience with their rodent problems, or at least that these problems do not recur in the same year. However, it is clear from the TNS study results (see Table 2 above) that rodent exposures recur within the same year for the majority of households currently using baits and other control measures, with the exception of PCOs. In fact, 12% of bait-using households and 13% of trap users reported “constant” or “monthly” rodent problems.

Accordingly, it is important to take into account not only the average number of placements required to achieve rodent control on a one-time basis, but also the average number of times that households experiencing rodent problems one or more times within a year must typically purchase and deploy their preferred control measures annually. The TNS study participants who used baits most often to control rodents reported purchasing and deploying baits an average of 2.8 times annually. Those who used snap traps or glue traps did so an average of 3.0 times in the past 12 months. Only those who used PCOs for rodent control reported an average of one use annually.

Estimating Economic Impact for Households Experiencing Rodent Problems

The most fundamental deficiency of the analysis presented in the BEAD Impact Assessment is that no attempt was made to develop estimates of the aggregate costs that would be imposed on households by the proposed decision. In this analysis, we have assembled and presented all of the essential data elements needed to develop a reliable assessment of the economic impact of EPA’s proposed decision on households experiencing rodent problems:

- actual data on the incidence of rodent problems
- current consumer choices of control options
- likely responses to changes in control measure availability
- the unit costs of control
- the frequency with which various control measures are deployed

In this section, we use these data to develop a basic assessment of the economic impact that would be borne by consumers if the Agency’s proposed decision is implemented. Because of the higher unit control costs involved in attempting to control rats, we develop separate

estimates of impact for the 1.75 million bait-using households with rat problems and the remaining 4.28 million bait-using households that are only attempting to control mice exposures. We first derive and present estimates of the additional costs for households facing rat problems. However, the methodology for estimating impact is the same for both groups of affected consumers.

Estimating Economic Impact on Households with Rat Problems

If the Agency's proposed decision were to be implemented, the aggregate costs incurred by households switching to each particular alternative control option can be calculated as the product of the number of households projected to choose that particular control option, the average annual costs per household associated with deploying that rodent control method, and the average number of times annually that purchase and use of that measure is typically required to achieve control of the rodent problem on a continuing basis. These calculations are presented in the top portions of Table 8-A (for households controlling rats) and Table 8-B (for households with only mice). For example, the aggregate costs imposed on households with rat problems who switch from restricted-use baits to PCOs are equal to the number of households switching (105,000) times the average cost of PCO service (\$254, according to the BEAD assessment), multiplied by the average number of times the measure must be applied annually to be effective (once on average, according to the TNS study), or \$26.67 million annually.¹¹

Tables 8-A and 8-B present two sets of household and control cost numbers: those associated with the affected households' initial choice of an alternative rodent control measure ("the first try" estimates) and the numbers of households that are projected to switch to bait stations initially, but subsequently will "re-select" another control measure because of the comparatively reduced effectiveness of the first-generation anticoagulants permitted in bait blocks (the "second try" estimates).¹² We discuss this "re-selection process" in more detail below.

¹¹ All estimates of the numbers of households and aggregate control expenditures in this assessment have been rounded to 1,000s.

¹² First generation anticoagulant products are less effective for a number of reasons, some having to do with rodent-resistance and others having to do with potency and pest feeding habits.

Table 8-A
Estimated Economic Impact on Bait-using Households with Rats

	% of HH	# of HH	Unit Cost	# of Times/ Year	Cost
Projected "1st Try" Control Measures					
Bait stations	49%	857,000	\$66.82	1.0	\$57,265,000
Snap traps	26%	454,000	\$11.24	3.0	\$15,309,000
Glue traps	17%	297,000	\$7.18	3.0	\$6,397,000
PCOs	6%	105,000	\$254.00	1.0	\$26,670,000
Cat/do nothing	2%	35,000	\$0.00		\$0
Subtotal	100%	1,748,000			\$105,641,000
Projected "2nd Try" Control Measures by Bait Station Users					
<i>28% continue with same control measure (bait effective)</i>					
Anti-coagulant	3.7%	64,000	\$8.50	1.8	\$979,000
Non-anticoagulant	24.5%	428,000	\$8.50	1.8	\$6,548,000
Subtotal	28.2%	492,000			\$7,527,000
<i>21% switch to alternative control measure (bait not effective)</i>					
Alternative bait	10.2%	178,000	\$8.50	1.8	\$2,723,000
Snap traps	5.4%	95,000	\$11.24	2.0	\$2,136,000
Glue traps	3.5%	62,000	\$7.18	2.0	\$890,000
PCOs	1.2%	22,000	\$254.00	1.0	\$5,588,000
Cat/do nothing	0.4%	7,000	\$0.00		\$0
Subtotal	20.8%	364,000			\$11,337,000
Total Projected Expenditures					\$124,505,000
Less Current Costs for Bait Users		1,748,000	\$4.80	2.8	\$23,493,000
Net Projected Impact for Households with Rats					\$101,012,000

Note: Bait station cost estimates assume two initial station placements and re-use for one year; snap and glue trap cost estimates assume four placements for each occurrence with no re-use of traps.

Source: Industry cost analysis for bait stations; BEAD impact assessment Table 7 (other methods)

"First-Try" Costs and Impact

For this impact assessment, we have assumed that all of the switching households that prefer a bait product for rodent control would at least initially try tamper-resistant bait stations, despite the significant increase in per-infestation control costs relative to those for current rodenticide bait products. The TNS study estimates that just under half (49%) of households that switch from one bait product subsequently purchase another bait product (see Table 7). Applying this 49% switching estimate to the population of 1.75 million bait-using households with rat problems, we estimate that 857,000 households that initially will try bait blocks in tamper-resistant bait stations as an alternative means of rat control. These households are assumed to purchase two bait stations initially at a combined cost of \$66.82.¹³ Similarly, the TNS switching matrix estimates that 26 percent of current bait users will switch to snap traps, which have low unit costs but which will on average require more placements to achieve control in households with more than minimal rodent problems. Accordingly, our economic assessment is based on the EPA "high cost" scenario, which assumes that affected households will have an average of four snap trap placements each time a rodent problem is addressed and that the traps are not re-used.

Table 8-A shows that the Agency's proposed decision would impose substantial economic losses on bait-using households attempting to control rats, *even if households choosing tamper-resistant bait stations were able to eliminate infestations with a single purchase and deployment*. These aggregate "first-try" costs for rat control alone are estimated to exceed \$105 million, or more than \$82 million in excess of these households' current annual expenditures of \$23.5 million for second-generation rodenticide baits.¹⁴ More than half of these estimated "first-try" costs are borne by consumers who select bait stations as their preferred new method of control. Our analysis indicates that these households will also sustain substantial additional control costs, both for replacement bait blocks and for other control measures to address rodent infestations not eliminated by first generation anticoagulant products.

"Second Try" Costs and Impact

It is important to recognize that a significant proportion of the households using bait stations with first-generation anticoagulants may encounter rodent-resistance issues—published reports estimate that as much as 85% of the rat population has developed resistance to warfarin or other first-generation anticoagulant baits. Furthermore, pest rodent behavior and feeding practices make it likely that bait blocks will be less effective. Consequently, the initial method

¹³ Households that purchase bait stations will need to make subsequent bait block purchases as well. These additional control costs are estimated in the "second-try" sections of Tables 7-A and 7-B.

¹⁴ Current control costs of \$23.5 million were estimated as the product of the estimated number of households with rat infestations annually (1.75 million), the BEAD assessment estimate of per-infestation control costs (\$4.80), and the average number of times (2.8) that bait-using households purchase and deploy rodenticide baits annually, according to the TNS study.

of control chosen following implementation of EPA's determination is labeled the "first try" option for control. For those who initially opt to purchase bait stations, many will have to choose a "second try" method if resistance to first-generation anticoagulants and product ineffectiveness limits the utility of the bait station option initially selected. In our impact assessment, we have estimated these "second-try" costs under the following assumptions:

1. Half of the bait stations sold will utilize non-anticoagulant baits, which are assumed to be effective for this analysis. The households initially selecting bait stations with these bait blocks are assumed to buy an average of 1.8 replacement bait blocks with the initial bait station purchase to control recurring rodent infestations during the same year.¹⁵
2. The other half of bait stations sold will be filled with first-generation anticoagulant baits, which may be ineffective in as many as 85% of deployments for a variety of reasons related to resistance problems and rodent feeding habits. Accordingly, only 15% of the households that have purchased the first-generation anticoagulant bait stations are assumed to buy replacement bait blocks with the same formulation.
3. The remaining 85% of those households who purchased bait stations filled with first-generation anticoagulant baits will need to "re-select" their control strategy to eliminate the rodent infestation. In this impact assessment, these re-selecting households are assumed to choose new measures in the same proportions as in the "first-try" switching matrix based on the TNS study results.

Applying these assumptions to the estimated numbers of households initially selecting bait stations as their preferred control measure yields the estimated "second try" costs shown in Table 8-A (for households with rats) and Table 8-B (for those with mice only). If all of the bait stations sold with non-anticoagulant baits and 15% of those with first-generation anticoagulants effectively eliminate the infestations, then 28% of all current bait-using households would achieve effective control and continue purchasing replacement bait blocks. Of the 21% of all current bait-using households who would switch to an alternative control measure because first-generation anticoagulant baits were not effective (49% choosing bait stations, minus 28% achieving effective control on the first try), nearly half (10.2% of all households with rats) are

¹⁵ It is possible that some households may choose to purchase more than one year's worth of replacement bait blocks with the initial bait station purchase. Costs for these households will be lower in subsequent years than estimated in this assessment until the supply of replacement bait blocks is exhausted. However, other households may not buy sufficient quantities of replacement bait blocks to control recurring infestations in the first year. Costs for these households will be much higher in the first year than estimated in this assessment. It is also important to keep in mind that the population of households affected by rodent problems is not static over time. Consequently, a substantial number of new households can be expected to make initial purchases of tamper-resistant bait stations in each year after any restrictions on consumer use of rodenticide baits are imposed.

assumed to switch to replacement bait blocks with alternative formulations, while the remainder are assumed to try other control strategies, including snap traps, glue traps, and PCOs.

Table 8-A indicates that these “second-try” costs add another significant increment of impact (nearly \$19 million annually) to the \$105 million in “first-try” costs annually that would be imposed on households that currently use rodenticide baits to control rat problems. Overall control expenditures for these 1.75 million households are projected to rise from the current level of \$23.5 million annually to \$124.5 million if the EPA’s proposed decision is implemented. The increase of \$101 million in yearly control costs would represent a 430% increase in household expenditures on rodent control. As we noted previously, more than half of this added burden would be imposed on minority and low-income households.

Estimating Economic Impact on Households with Mice Problems

While households with rat problems face higher unit costs for control measures other than PCOs, there are a much larger number (4.28 million) of households currently using rodenticide baits that are attempting to control only mice. The costs of the various control measures borne by this group of households are estimated in Table 8-B below.¹⁶

Table 8-B shows that Agency’s proposed decision would impose substantial economic losses on bait-using households attempting to control mice only, *even if households choosing tamper-resistant bait stations were able to eliminate infestations with a single purchase and deployment*. These aggregate “first-try” costs for controlling mice are estimated to exceed \$142 million, or more than \$113 million in excess of these households’ current annual expenditures of \$28.8 million for second-generation rodenticide baits.¹⁷ In contrast to our analysis of control costs for households with rat problems, the largest share of these added expenditures are attributable to increased utilization of PCOs—partly because there are a larger number of households with mice only, and partly because the per-unit costs of controlling mice with bait stations are expected to be substantially lower than for rats (\$26.04, based on industry cost estimates for two mouse-sized bait stations, compared with \$66.82 for two rat-sized bait stations). As in our analysis of rat control costs, many of the households with mice only who opt for bait stations as their “first-try” control strategy will also sustain substantial additional “second-try” costs. In this impact assessment we estimate that these “second-try” costs will raise

¹⁶ According to the TNS study, 15% of households that most often use rodenticide baits have both rat and mouse infestations. In this assessment, we have included these households in our rat control cost and impact estimates, and have not estimated any incremental costs for controlling mice. It is likely, however, that these households will face additional control costs because the infestations may not be in the same locations and because mice may not be effectively controlled with products designed to eliminate rats.

¹⁷ Current control costs of \$28.8 million were estimated as the product of the estimated number of households with mice-only infestations annually (4.28 million), the BEAD assessment estimate of per-infestation control costs (\$2.40), and the average number of times (2.8) that bait-using households purchase and deploy rodenticide baits annually, according to the TNS study.

expenditures for households with mice only that are currently using rodenticide baits by another \$29 million annually.

Overall control expenditures for these 4.28 million households are projected to rise from the current level of \$28.8 million annually to \$171.6 million if the EPA's proposed decision is implemented. The increase of nearly \$143 million in yearly control costs would represent a 500% increase in household expenditures on rodent control. As we noted previously, more than a third of this added burden would be imposed on minority and low-income households.

Table 8-B
Estimated Economic Impact on Bait-using Households with Mice Only

	% of HH	# of HH	Unit Cost	# of Times/ Year	Cost
Projected "1st Try" Control Measures					
Bait stations	49%	2,097,000	\$26.04	1.0	\$54,606,000
Snap traps	26%	1,113,000	\$5.58	3.0	\$18,632,000
Glue traps	17%	728,000	\$1.81	3.0	\$3,953,000
PCOs	6%	257,000	\$254.00	1.0	\$65,278,000
Cat/do nothing	2%	86,000	\$0.00		\$0
Subtotal	100%	4,281,000			\$142,469,000
Projected "2nd Try" Control Measures by Bait Station Users					
<i>28% continue with same control measure (bait effective)</i>					
Anti-coagulant	3.7%	157,000	\$4.25	1.8	\$1,201,000
Non-anticoagulant	24.5%	1,049,000	\$4.25	1.8	\$8,025,000
Subtotal	28.2%	1,206,000			\$9,226,000
<i>21% switch to alternative control measure (bait not effective)</i>					
Alternative bait	10.2%	437,000	\$4.25	1.8	\$3,343,000
Snap traps	5.4%	232,000	\$5.58	2.0	\$2,589,000
Glue traps	3.5%	152,000	\$1.81	2.0	\$550,000
PCOs	1.2%	53,000	\$254.00	1.0	\$13,462,000
Cat/do nothing	0.4%	18,000	\$0.00		\$0
Subtotal	20.8%	892,000			\$19,944,000
Total Projected Expenditures					\$171,639,000
Less Current Costs for Bait Users		4,280,000	\$2.40	2.8	\$28,762,000
Net Projected Impact for Households with Only Mice					\$142,877,000

Note: Bait station cost estimates assume two initial station placements and re-use for one year; snap and glue trap cost estimates assume four placements for each occurrence with no re-use of traps.

Source: Industry cost analysis for bait stations; BEAD impact assessment Table 7 (other methods)

Aggregate Economic Impact on Bait-using Households

Based on this economic assessment, the aggregate impact of EPA's proposed decision *solely on households currently using rodenticide baits to control rodents* is estimated at nearly \$244 million annually, almost 2 ½ times the \$100 million threshold that commonly is recognized as constituting a substantial impact that warrants a full-scale regulatory analysis as part of the regulatory development and implementation process. The elements of this aggregate impact from Tables 8-A and 8-B are summarized below in Table 9.

It is important to note that the principal result of this assessment—that the aggregate burden on consumers is substantial enough to warrant a full-scale regulatory analysis—is not at all dependent on use of the industry-supplied unit cost estimates for tamper-resistant bait stations. In Table 9 we present a companion set of impact calculations derived using the EPA unit cost estimates for rat- and mouse-sized bait stations and for replacement bait blocks.¹⁸ Even in this scenario, the net economic impact on households currently using rodenticide baits is estimated to be greater than \$150 million annually.

Table 9
Summary of Economic Impact Assessment

	Bait Station Cost Estimate	
	Industry	EPA
Impact on Households with Rats		
"First Try" Control Costs	\$105,641,000	\$70,504,000
"Second Try" Costs for Bait Station Users	\$18,864,000	\$11,508,000
(Less Current Control Costs)	-\$23,493,000	-\$23,493,000
Net Economic Impact	\$101,012,000	\$58,519,000
Impact on Households with Mice Only		
"First Try" Control Costs	\$142,469,000	\$100,875,000
"Second Try" Costs for Bait Station Users	\$29,170,000	\$20,150,000
(Less Current Control Costs)	-\$28,762,000	-\$28,762,000
Net Economic Impact	\$142,877,000	\$92,263,000
Total Projected Control Costs	\$296,144,000	\$203,037,000
(Less Current Control Costs)	-\$52,255,000	-\$52,255,000
Net Impact on Households Currently Using Baits	\$243,889,000	\$150,782,000

¹⁸ The "high" control cost scenario in Table 7 of the BEAD impact assessment is based on unit costs of \$51.64 and \$12.41 for controlling rat and mouse infestations, respectively, using four bait stations. These unit cost estimates are divided by two to make them equivalent to the per-infestation costs associated with two bait station placements, the scenario used in our economic assessment.

Limitations of the Assessment of Economic Impact on Households

The data generated demonstrate that the Agency's proposed decision would impose substantial additional rodent control costs on consumers who now use rodenticide baits. Achieving rodent control without access to second-generation anticoagulant baits could cost American consumers more than \$296 million annually by applying the switching scenario analyzed. This is more than six times the current control costs borne by the six million households currently using baits for rodent control.

However, even the projected \$296 million in additional costs to consumers should be considered conservative because it does not address many potentially adverse impacts of the EPA's proposed risk mitigation decision. This understatement is attributable to a limited number of households that the consumer market research data indicate will simply do nothing instead of switching to another type of rodent control measure if the current rodenticide bait products are no longer available. These costs are more difficult to quantify, partly because individual household decisions to forgo control measures will impose "externalities" on neighboring households that inevitably will face increased rodent exposures as a result of the reduced level of control measures being deployed in adjacent areas. Furthermore, we have not included the substantial costs that would be experienced in the form of property damage and other impacts incurred by households that cannot effectively or affordably treat rodent infestations. One indication of the potential magnitude of these costs is provided by the Food and Agriculture Organization (FAO) of the United Nations, which cites estimates of U.S. food supply losses from rodent damage at \$900 million annually.¹⁹

Potential Health Benefits and Adverse Impacts

A complete economic assessment should not only take into account the economic costs that would be imposed on consumers under the proposed risk mitigation decision, but it should examine whether the potential benefits (in the form of reduced human exposures to rodenticides) have been reasonably evaluated.²⁰ In this work we frequently tabulate and analyze data available from the major consumer product-related hazard monitoring databases that are maintained by the Consumer Product Safety Commission (CPSC). The most relevant data for this impact assessment are available from National Electronic Injury Surveillance System (NEISS) incident reports. The NEISS database provides several hundred thousand reports annually on product-related incidents that result in hospital emergency room (ER) visits. The structure of the NEISS

¹⁹ FAO Agricultural Services Bulletin No. 109, *Grain Storage Techniques: Evolution and Trends in Developing Countries*, Ch. 9, "The Economic Importance of Rodent Pests", available at <http://www.fao.org/docrep/t1838e/t1838e1j.htm>.

²⁰ Heiden Associates brings to this task extensive capabilities and experience in the areas of statistical product safety and quantitative risk assessment. A more detailed exposition of our capabilities in this practice area is available at www.heideninc.com.

network and coding procedures supports the derivation of statistically reliable estimates of the frequency and severity of various types of product- or hazard-specific injuries, such as those associated with household exposures to rodenticides.

To assess the impact of restrictions on rodenticide bait use in terms of reduced numbers of ER visits, we extracted, reviewed, coded, and tabulated all incident reports on the NEISS database during the most recent five years (2002-2006) coded as being associated with some type of pesticide or animal trap.²¹ The narrative descriptions of each extracted report were reviewed to determine if a rodent control product of some type potentially contributed to the ER visit. Finally, the sample weights of incidents that were potentially associated with either of these two types of rodent control products were used to develop annual estimates of the number of ER visits for four summary age groups. The results of this analysis are presented in Table 10.

²¹ Product-related incidents potentially associated with rodenticide exposures were identified by searching the NEISS database for incidents under product code 1926 (which also includes herbicides, insecticides, repellants, and roach and flea products) and then reviewing the narrative descriptions of each reported incident to determine if the product listed was a rodenticide or some other type of pesticide. Similarly, incidents associated with snap or glue traps were identified by searching the NEISS database for incidents reported under product code 1432 (animal traps) and then reviewing the narrative descriptions of each reported incident to determine if the product listed was a snap or glue trap or some other type of animal trap.

Table 10
Average Annual ER Visits by Age Group

Type	Age Range	Estimated # of Visits / Year	% of All Visits	Estimated # Hospitalized / Year	% of Cases in Age Range
Snap/Glue Traps (included in NEISS code 1432)					
	Under 2	83	16%		
	2 - 5	49	10%		
	6 - 19	67	13%		
	Over 19	309	61%		
	Subtotal	508		0	0%
Rodenticides (included in NEISS code 1926)					
	Under 2	266	56%	18	7%
	2 - 5	167	35%		
	6 - 19	17	4%		
	Over 19	23	5%		
	Subtotal	472		18	4%
Total		987		18	2%

Source: Heiden Associates review and tabulation of 2002-2006 NEISS incident reports.

As Table 10 shows, there were fewer than 500 ER visits annually that were associated with exposure to rodenticides of all types. Our companion analysis of the incident reports associated with animal traps indicates that snap trap and glue trap related-injuries account for more ER visits (an average of 508 annually in 2002-2006) than do rodenticide baits, although the age-profile of these visits is less skewed toward children under six.²²

Slightly more than half (56%) of these involve children under the age of two, who are in most cases not able to report how much (if any) rodenticide they may have ingested. Hospitalization occurred in fewer than 20 cases (4% of the total number of ER visits) during the five-year period, and these hospitalizations were generally for observation, rather than treatment, purposes. No hospital admissions of children in the 2-5 year age range that accounted for nearly all of the remaining ER visits associated with rodenticides were reported in the most recent five

²² Like the ER visits associated with exposures to rodenticides, injuries associated with snap traps and glue traps (which occur from contact with the traps in some cases, but also as a result of bites sustained from animals caught in the traps) are rarely serious enough to warrant hospitalization.

years of the NEISS database. This result is corroborated by those from a more comprehensive review of the medical significance of rodenticide exposures, which is presented below.

It is also worth noting that restricting access to second-generation anticoagulants will not eliminate hospital emergency room visits associated with rodent control measures, for at least two reasons:

1. Households will still purchase bait block products specifically for use in bait stations, and it is likely that some toddlers will still gain access to replacement or new bait blocks that are stored improperly.
2. Our economic analysis indicates that many households currently using baits will switch to using snap traps or glue traps if the proposed decision is implemented. This will result in more ER admissions for trap-related injuries.

Based on our estimates of households switching to various control strategies as a result of the proposed restrictions on consumer use of rodenticide baits, it is possible that the number of U.S. households most frequently using snap traps or glue traps as their primary method of controlling rodents could increase by more than 40%. In addition, many of these switching households may be less familiar with using these products than current users, suggesting that the injury rate among the switching households may be initially higher than for those with previous experience with these types of control measures. Accordingly, it would be reasonable to anticipate that there will be 200 or more additional ER visits annually for injuries associated with snap traps and glue traps if the proposed decision is adopted.

Additional Comments on the Benefits and Costs of Restrictions on Consumer Use of Rodenticide Baits

In contrast to our analysis, the EPA Impact Assessment relies on an alternative source of reported incidents involving chemical exposures, in the form of annual summary reports from the Toxic Exposure Surveillance System (TESS) operated by the American Association of Poison Control Centers. One of the primary benefits of the proposed decision cited in the BEAD impact assessment is the anticipated reduction in second-generation anticoagulant rodenticide exposures involving children, primarily those under six. However, it is important to point out that while the number of reported exposures is relatively large (an average of 16-17,000 calls/contacts to poison control centers annually during the period from 2002 through 2004), very few of these exposures result in even minor health effects. According to a recent national medical consensus panel white paper on second-generation anticoagulants reporting on a review of more than 20,000 accidental exposures reported to poison centers over a 20-year period involving children under the age of 6 years, none ever developed physical evidence of toxicity. The panel found that there has never been a recorded death of a child from any "blood thinning" (anticoagulant) rat and mouse poisons, and that there has never been a reported case of a child getting seriously

ill as a result of accidentally ingesting any of these products. Thus, the panel concluded that in the vast majority of exposure cases, no treatment of any kind was indicated.²³

In addition, it is clear that neither the TESS nor the NEISS data adequately capture the number of injuries sustained by children from rodent bites. Most of these incidents do not result in calls to a poison control center, and most requiring medical attention are treated in doctor's offices or clinics, rather than hospital ERs. Nonetheless, to the extent that restricting access to rodenticide baits causes households to either use less effective control methods or abandon control attempts, the number of rodent bites experienced by children can be expected to increase if EPA adopts the proposed decision. One current estimate is that 10,000 people or more sustain rodent bites annually, with children in urban areas accounting for the largest share of the victims.²⁴ Based on our estimates of households switching to various control strategies as a result of the proposed restrictions on consumer use of rodenticide baits, it is possible that the number of U.S. households that do not deploy any measures to control rodents could increase by as much as 20%. If these households experience rodent infestations at the same rate as those which do not currently deploy rodent control measures, it is possible that the number of rodent bites could increase by as many as 2,000 cases annually.

Rodenticide Exposures in the Context of All Household Chemical Exposures

This impact analysis has demonstrated that the economic costs that would be imposed on households using rodenticide bait products by the proposed decision would be very large, and that the benefits of reducing rodenticide exposures to children would be modest at best. In our view, it is appropriate to examine the significance of these exposures in the context of all household chemical exposures involving children under six, the age-range that includes nearly all cases of potential or actual ingestion of rodenticide baits.

Using the NEISS database for the most recent five years (2002-2006)²⁵, we developed a complete set of annual estimates of ER visits involving children under six associated with all of the household chemical products tracked by the system, including cleaning products, hydrocarbons, automotive chemicals, soaps and laundry products, room deodorizers, and

²³ "Long-acting anticoagulant rodenticide poisoning: An evidence-based consensus guideline for out-of-hospital management," *Clinical Toxicology* 45, 1-22 (Cavarti et al., 2007) ("Practice Guidelines"), which was supported, *inter alia*, by the American Association of Poison Control Centers ("AAPCC") and the Department of Health and Human Services ("HHS")

²⁴ See the discussion in "A White Paper Response to the Proposed EPA Mitigation Measures on Rodenticides of 1/17/2007", Kaukainen and Colvin, May 6, 2007, especially at p.5.

²⁵ While the 2006 NEISS incident report file has not been declared final and released by CPSC, our experience is that more than 99.99% of the reports for the previous year have been entered during that calendar year or before May 1st of the following year. It is therefore very likely that the data used to develop the estimates presented here household chemical product-related ER visits in 2006 will be exactly the same as those in the file released by the Commission later this year.

construction materials, as well as insecticides, rodenticides, herbicides, and fertilizers. The estimates for each product category were then ranked in descending order according to the number of exposures annually for which the child involved was not treated and released directly after the ER visit. For each product category, we divided the annual number of hospital stays by the number (18 per year) for rodenticide bait products to obtain a measure of each product group's contribution to the overall level of child chemical exposures, relative to the contribution of the products whose use would be restricted by EPA's proposed decision.

We present the results of this analysis in Table 11 on the next page, which shows that there are 25 distinct categories of household chemical products that are each associated with larger numbers of hospital stays annually than is the case for rodenticides. In fact, rodenticides are currently associated with less than one percent of all household chemical exposures that result in hospital stays even for observation purposes only. Moreover, it is important to note that the reported incidents associated with rodenticides that resulted in hospital stays were for observation purposes only; there is no record on the NEISS database of any treatment medical being required.

Table 11
Annual Exposures to Household Chemicals Involving Children Under 6
Resulting in Overnight Hospital Stays

NEISS Code	NEISS Product Category	# ER Visits	# Hospitalized	Ratio to Rodenticides
964	Lamp Oils	710	239	13.1
956	Bleaches (Noncosmetic)	3,753	187	10.2
921	Chemicals, Not Elsewhere Classified	1,440	180	9.9
954	General Purpose Household Cleaners	1,877	155	8.5
955	Automotive Chemicals	296	128	7.0
940	Lighter Fluids	396	91	5.0
945	Pine Oil Cleaning, Disinfectant Preparations	706	77	4.2
910	Gasoline	626	61	3.3
963	Kerosene	242	60	3.3
968	Caustics	64	45	2.4
960	Paints, Varnishes or Shellacs	550	42	2.3
905	Furniture Polishes or Waxes	219	38	2.1
965	Fuel Oils, Not Specified	98	35	1.9
930	Ammonia, Household	189	35	1.9
929	Drain Cleaners	193	31	1.7
983	Soaps (excl. Laundry Soaps or Detergents)	557	29	1.6
915	Methyl Alcohol (Solvent)	62	28	1.5
942	Oven Cleaners	96	27	1.5
908	Paint or Varnish Thinners	299	27	1.5
966	Antifreeze	153	26	1.5
913	Lubricants	199	26	1.4
975	Room Deodorizers or Fresheners, Not Specified	185	26	1.4
977	Spot Removers or Cleaning Fluids	273	24	1.3
953	Abrasive Cleaners	298	21	1.1
951	Toilet Bowl Products	369	19	1.1
1926-R	RODENTICIDES	429	18	1.0
973	Liquid Room Deodorizers or Fresheners	431	17	1.0
972	Paint/Varnish Removers (Excl. Turpentine)	94	16	0.9
978	Automotive Waxes, Polishes or Cleaners	117	15	0.8
	All Others*	2,778	108	5.9
	Total	17,697	1,831	100.4

*Includes all individual product categories with fewer than 15 hospitalizations of children under 6 annually.
Source: Heiden Associates coding and tabulation of 2002-2006 NEISS database files.

The results presented in Table 11 demonstrate that, relative to rodenticide baits, there are many more such cases for the following types of products:

- 13 times as many cases associated with ingestion of lamp oil,
- 10 times as many cases associated with bleach exposures,
- 7 times as many cases associated with automotive chemicals (excluding antifreeze),
- 4 times as many cases associated with pine oil cleaners,
- twice as many cases associated with furniture polishes and waxes, and
- 1.5 times as many cases associated with oven cleaners.

These estimates demonstrate that EPA's proposal for further regulating consumer use of rodenticide products will have a virtually negligible effect on household chemical exposures involving children under 6, while imposing additional rodent control costs greatly in excess of \$200 million.